Contents Volume 186 (1996)

Advances in the positional cloningof nodulating genes in soybean 1–7
G. Ceastano-Anollés, P.M. Gresshoff

Molecular analysis of actinorhizal symbiotic systems: Progress to date 9–20
B.C. Mullin, S.V. Dobritsa

Diversity of Rhizobia isolated from various *Hedysarum* species 21–28
B.D. Kishinevsky, D. Sen, G. Yang

Diazotrophic endophytes: progress and prospects for nitrogen fixation in monocots 29–38
E.W. Triplett

Drought-avoidant soybean germplasm maintains nitrogen-fixation capacity under water stress 39–43
P. Patterson, C.M. Hudak

Phylogeny and taxonomy of rhizobia 45–52
J.P.W. Young

Comparison of rhizobitoxine- induced inhibition of β-cystathionase from different bradyrhizobia and soybean genoytypes 53–61
K. Xiong, J.J. Fuhrmann

Assimilation of *nod* gene inducer ^{14}C-naringenin and the incorporation of labelled carbon atoms into the acyl side chain of a host-specific Nod factor produced by *Rhizobium leguminosarum* bv. *viciae* 63–68
J.R. Rao, J.E. Cooper, E.S.W. Everaert, L. de Cooman

Corresponding 16s rRNA gene segments in *Rhizobiaceae* and *Aeromonas* yield discorant phylogenies 69–74
B.D. Eardly, F.-S. Wang, P. van Berkum

Rapid evaluation of peat-base legume inoculant using immunomagnetic beads for cell retrievel and fluorescent nucleic acid probes for viability analysis 75–79
P.E. Olsen, W.A. Rice

Detection of genetic variation in *Bradyrhizobium japonicum* USDA 110 variants using DNA fingerprints generated with GC rich arbitrary PCR primers 81–85
J.N. Mathis, D.E. Mcmillin

Mimosine produced by the tree-legume *Leucaena* growth advantages to some *Rhizobium* strains that utilize it as a source of carbon and nitrogen 87–92
M. Soedarjo, D. Borthakur

Subnanomolar concentration of membrane chitolipooligosaccharides from *Rhizobium leguminosarum* biovar *trifolii* are fully capable of eliciting symbiosis-related responses on white clover 93–98
G.G. Orgambide, S. Philip-Hollingsworth, P.F. Mateos, R.I. Hollingsworth, F.B. Dazzo

Analysis of the two nodulins, sucrose synthase and ENOD2, in transgenic *lotus* plants 99–106
L. Skø, F.R. Minchin, E. Timms, M.T. Fortune, K.J. Webb, A.J. Gordon

Hopanoid lipids in *Bradyrhizobium* and other plant-associated bacteria and cloning of the *Bradyrhizobium japonicum* squalene-hopene cyclase gene 107–112
E.L. Kannenberg, M. Perzl, P. Müller, T. Härtner, K. Poralla

Presence of unique repeated insetion sequences in nodulation genes of *Rhizobium 'hedysari'* 113–120
F. Meneghetti, S. Alberghini, E. Tola, A. Giacomini, F.J. Ollero, A. Squatrini, M.P. Nuti

Enhanced competitiveness of a *Bradyrhizobium japonicum* mutant strain improved for nodulation and nitrogen fixation 121–126
L.D. Kuykendall, F.M. Hashem, W.J. Hunter

Phage Susceptibility and plasmid profile analysis of *Sinorhizobium fredii* 127–134
F.M. Hashem, L.D. Kuykendall, S.E. Udell, P.M. Thomas

Adiazotrophic bacterial endophyte isolated from stems of *Zea mays* L. and *Zea luxurians* Iltis and Doebley 135–142
J.A. Palus, J. Borneman, P.W. Ludden, E.W. Triplett

Identification of enzymes involved in indole-3-acetic acid degradation 143–149
M.R. Olesen, B.U. Jochimsen

Toward a new concept of the evolution of symbiotic nitrogen fixation in the Leguminosae 151–159
J.A. Bryan, G.P. Berlyn, J.C. Gordon

Lipopolysaccharide core components of *Rhizobium etli* reacting with a panel of monoclonal antibodies 161–166
E.L. Kannenberg, L.S. Forsberg, R.W. Carlson

Deversity in symbiotic specificity of cowpea rhizobia indigenous to Zimbabwean soils 167–171
S. Mpepereki, A.G. Wollum II, F. Makonese

Host genetics control of symbiosis in soybean (*Glycine max.* L.) 173–187
T. Devine, D. Kuykendall

Role of cell wall of groundnut roots in solubilizing sparingly soluble phosphorus in soil 197–204
N. Ae, T. Otani, T. Makino, J. Tazawa

Effects of an African grass invasion on Hawaiian shrubland nitrogen biogeochemistry 205–211
G.P. Asner, S.W. Beatty

Masking of antibiotic-resistance upon recovery of endophytic bacteria 213–218
J.A. McInroy, G. Musson, G. Wei, J.W. Kloepper

Genotypic variation in zinc efficiency and resistance to crown rot disease (*Fusarium graminearum* Schw. Group 1) in wheat 219–226
H.S. Grewal, R.D. Graham, Z. Rengel

Photosynthesis in leaves in siliques of winter oilseed rape (*Brassica napus* L.) 227–236
L.H. Gammelvind, J.K. Schjoerring, V.O. Mogensen, C.R. Jensen, J.G.H. Bock

Modelling non-uniform soil water uptake by a single plant root 237–243
E. Aura

Effects of air-filled soil porosity and aeration on the initiation and growth of secondary roots of maize (*Zea mays*) 245–254
J. Liang, J. Zhang, M.H. Wong

Extractability of nickel and its concentration in cultivated plants in Ni rich ultramafic soils of New Caledonia 255–264
L. L'Huillier, S. Edighoffer

Effects of urine on soil microbial biomass, methanogenesis, nitrification and denitrification in grassland soils 265–273
R.D. Lovell, S.C. Jarvis

Bioavailability index for quantitative evaluation of plant availability of extractable soil trace elements 275–283
B. Chen, X. Shan, J. Qian

Chemical soil conditions in pristine *Nothofagus* forests of New Zealand as compared to German forests 285–291
E. Matzner, M. Davis

Nutrient stocks in managed and natural humid tropical fallows 293–309
L.T. Szott, C.A. Palm

Effects of suboptimal root zone temperatures and shoot demand on net translocation of micronutrients from the roots to the shoot of maize 311–320
C. Engels, H. Marschner

Effects of solution pH and bicarbonate on the growth and nodulation of a range of grain legume species 321–330
C. Tang, B.D. Thomson

Comparison between parental and variant soybean *Bradyrhizobium* strains with regard to the production of lipo-chitin nodulation signals, early stages of root infection, nodule occupancy, and N_2 fixation rates 331–341
M. Hungria, C.Y.M. Nishi, J. Cohn, G. Stacey

Site disturbance effects on a clay soil under radiata pine 343–351
D. Zabowski, P.T. Rygiewicz, M.F. Skinner

Effects on chemical surface properties of tuff by growing rose plants 353–360
A. Silber, M. Raviv

Effects of varied soil nitrogen supply on Norway spruce (*Picea abies* [L.] Karst.) II. Carbon metabolism in needles and mycorrhizal roots 361–369
T. Wallenda, C. Schaeffer, W. Einig, A. Wingler, R. Hampp, B. Seith, E. George, H. Marschner

Volume contents 371–373

Author index 375

Instructions to authors (1996) 377–379